FOURTH FIVE-YEAR REVIEW

E. I. DU PONT DE NEMOURS & CO., INC.
COUNTY ROAD X-23 SUPERFUND SITE
IAD980685804
LEE COUNTY, IOWA

JUNE 2012

Prepared by:
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Region VII
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Kansas City, Kansas 66101

Approved by:

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06/26/12
Date

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List of Abbreviations and Acronyms

ARARs	Applicable or relevant and appropriate requirements
ASTM	American Society for Testing and Materials
bgs	Below ground surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of concern
Eco-SSLs	Ecological Soil Screening Levels
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Difference
IDNR	Iowa Department of Natural Resources
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
mg/l	Milligram per liter
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
RAO	Remedial action objective
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSL	Regional Screening Level
TBC	To Be Considered
UCS	Unconfined Compressive Strength

VOCs	Volatile organic compounds
µg/l	Microgram per liter

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: E.I. du Pont de Nemours & Co., Inc.-County Road X-23		
EPA ID: IAD980685804		
Region: 7	**State:** IA	**City/County:** West Point/Lee

SITE STATUS	
NPL Status: Deleted	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Diana Engeman
Author affiliation: EPA-Region 7
Review period: 6/22/2011 - 6/1/2012
Date of site inspection: 5/17/2012
Type of review: Statutory
Review number: 4
Triggering action date: 8/15/2007
Due date *(five years after triggering action date)*: 8/15/2012

Five-Year Review Summary Form (continued)

The table below is for the purpose of the summary form and associated data entry and does not replace the two tables required in Section VIII and IX by the FYR guidance. Instead, data entry in this section should match information in Section VII and IX of the FYR report.

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): Click here to enter text.	**Issue Category:** Choose an item.			
	Issue: Click here to enter text.			
	Recommendation: Click here to enter text.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Choose an item.	Choose an item.	Choose an item.	Choose an item.	Enter date.

To add additional issues/recommendations here, copy and paste the above table as many times as necessary to document all issues/recommendations identified in the FYR report.

Protectiveness Statement(s)
Include each individual OU protectiveness determination and statement. If you need to add more protectiveness determinations and statements for additional OUs, copy and paste the table below as many times as necessary to complete for each OU evaluated in the FYR report.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU1	Protective	Click here to enter date.
Protectiveness Statement: The remedy at the E.I. du Pont de Nemours & Co., Inc. County Road X-23 site is protective of human health and the environment.		

Sitewide Protectiveness Statement (if applicable)	
For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.	
Protectiveness Determination: Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at the E.I. du Pont de Nemours & Co., Inc. County Road X-23 site is protective of human health and the environment.	

Executive Summary

The E. I. du Pont de Nemours & Co., Inc., County Road X-23 Superfund site in Lee County, Iowa, consists of two subsites, known as the Baier and McCarl subsites. The remedy for the site included stabilization and solidification of contaminated soil from both subsites into a solid monolith which was covered with a soil cap at the Baier subsite. The remedy also included groundwater monitoring and the implementation of covenants and deed notices restricting the future use of the subsites. The site achieved construction completion with the signing of the Preliminary Closeout Report on September 29, 1993. The site was deleted from the National Priorities List on September 25, 1995. The trigger for this five-year review was the signing of the third Five-Year Review Report on August 15, 2007.

The determination that has been made during this five-year review is that the remedy continues to function as designed. The immediate threats have been addressed and the remedy continues to be protective.

1.0 Introduction

The purpose of five-year reviews under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601- 9675, is to determine whether the remedy at a site remains protective of human health and the environment. The methods, findings and conclusions of such reviews are documented in five-year review reports. In addition, five-year reviews identify issues found during the review, if any and presents recommendations to address them.

The U.S. Environmental Protection Agency prepared this five-year review pursuant to Section 121(c) of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Section 121(c) of CERCLA provides:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews and any actions taken as a result of such reviews.

The EPA has interpreted this requirement in the NCP; 40 CFR § 300.430(f)(4)(ii) provides:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The EPA has conducted a five-year review of the remedial actions implemented at the E. I. du Pont de Nemours & Co., Inc. County Road X-23 site in Lee County, Iowa. This review was conducted from June 2011 through June 2012. This report documents the results of that review.

This is the fourth five-year review for the site. The triggering action for this fourth statutory review is the completion date of the third five-year review which was August 15, 2007, as shown in the EPA's WasteLAN database. The five-year review is required because hazardous substances, pollutants or contaminants remain on the site above levels that allow for unlimited use and unrestricted exposure.

2.0 Site Chronology

Table 1 presents a summary of the major site events and relevant dates.

Table 1
Chronology of Site Events

EVENT	Date
Initial discovery of contamination	11/1979
Removal actions conducted	1990-1992
Final listing on National Priorities List (NPL)	8/30/1990
Remedial Investigation/Feasibility Study (RI/FS) completed	1/1991
Proposed Plan made available for public comment	4/1991
Record of Decision (ROD) signed	5/28/1991
Consent Decree (CD) for Remedial Design/Remedial Action (RD/RA) finalized	4/23/1992
ROD Explanation of Significant Differences (ESD) signed	5/11/1992
RD completed and RA construction began	6/5/1992
Preliminary Close-Out Report signed	9/29/1993
Final Close-Out Report signed	8/1/1994
Site deleted from the NPL	9/25/1995
First five-year review signed	6/19/1997
Second five-year review signed	8/16/2002
Third five-year review signed	8/15/2007

3.0 Background

3.1 Physical Characteristics

The DuPont County Road X-23 site, consisting of the Baier and McCarl subsites, is located in rural Lee County, Iowa, approximately 3.5 miles south of the town of West Point. The two subsites are located about three-fourths of a mile apart, in Township 68 North and Range 5 West. The Baier subsite is located in the southwest quarter of Section 28, and the McCarl subsite is located in the southwest quarter of Section 22 (see Figure 1). The Baier subsite encompasses approximately 13 acres of which 3.5 acres

are where the treated soil is located. The subsite is accessible via County Road X-23. The McCarl subsite encompasses approximately 1.25 acres located in a largely undeveloped, wooded area.

3.2 Land and Resource Use

Land use in the vicinity of the subsites was, and continues to be, agricultural with some scattered residences. The Baier subsite is surrounded by pastures and forests. There is a residence on the property adjacent to the McCarl subsite. Land use in the vicinity of the subsites is not anticipated to change substantially in the future.

Groundwater at the McCarl and Baier subsites is encountered in perched, shallow water-bearing zones at approximately 20 feet below ground surface (bgs). A deeper groundwater zone is found at approximately 60 feet bgs. The upper and lower water-bearing zones are separated by a confining unit. The shallow water-bearing unit does not provide enough water to serve as a source of drinking water.

3.3 History of Contamination

Between April 1949 and November 1953, wastes generated at DuPont's paint manufacturing facility in Fort Madison, Iowa, were disposed of at the Baier and McCarl subsites. Limited information is available about the volume of waste that was generated but it was estimated that between 48,000 and 72,000 55-gallon drums of waste were disposed at the two subsites. In addition to drummed wastes, paint waste was placed in trenches and burned. An estimate of the volume of material burned indicated that between 4,500 and 7,000 tons of ash was present at the subsites. The Baier subsite was the primary disposal area; however, during inclement weather, when the Baier subsite was inaccessible, wastes were disposed at the McCarl subsite.

Contamination in soil consisted primarily of metals including lead, cadmium, chromium and selenium and organic compounds including toluene, ethylbenzene, total xylenes and naphthalene. Remedial investigation data from both subsites indicated that the areal extent of lead contamination in soil defined the surface area of contamination and that lead contamination rapidly attenuated with depth, decreasing to the background level of 350 milligrams/kilogram (mg/kg) at four feet bgs.

Total xylenes, ethylbenzene and selenium were the primary contaminants in the shallow groundwater at the Baier subsite. Selenium, lead, arsenic, barium, cadmium and chromium were the contaminants found in shallow groundwater at the McCarl subsite. Deeper monitoring wells were not impacted by site-related contaminants at either subsite.

3.4 Initial Response

The EPA conducted investigations at the subsites from 1983 through 1986, during which volatile organic compounds (VOCs) and metals contamination were identified. As a result of site contamination identified in soil and groundwater, the DuPont County Road X-23 site was proposed for inclusion on the NPL in June 1988 and the listing became final in August 1990.

In January 1991, DuPont completed Remedial Investigation and Feasibility Study Reports for the site. In April 1991, a Proposed Plan identifying the EPA's preferred remedy was presented to the public during a public comment period.

3.5 Basis for Taking Action

A Baseline Risk Assessment to evaluate human health risks and an Ecological Risk Assessment were prepared and included as Appendices H and I, respectively, to the final Remedial Investigation Report. The Baseline Risk Assessment evaluated the current exposure scenarios. A Supplemental Risk Assessment Report was prepared by the EPA to evaluate the potential future residential risks. It was determined that exposure to soil at both subsites presented significant human health risks associated with a future land use scenario involving residential exposures. Increased health risks were found to be due to the noncarcinogenic effects of exposure to cadmium, chromium, selenium and lead. It was also determined in the Baseline Risk Assessment that no exposure to contaminated groundwater would occur due to the low groundwater yield from the contaminated zone.

The potential contaminants of concern in soil at the Baier and McCarl subsites are:

Inorganic Contaminants	VOCs	Semi-volatile Contaminants
Arsenic	Ethylbenzene	Bis(2-ethylhexyl)phthalate
Barium*	4-methyl-2-pentanone	2-methyl naphthalene
Cadmium	Toluene	Naphthalene
Chromium	1,1,1-trichloroethane**	
Copper*	Xylenes	
Lead		
Manganese*		
Selenium		
Zinc		

* Contaminant found at the McCarl subsite only.
** Contaminant found at the Baier subsite only.

4.0 Remedial Actions

4.1 Remedy Selection

The ROD for the DuPont County Road X-23 site was signed by the Regional Administrator of the EPA Region 7 on May 28, 1991. Remedial Action Objectives (RAOs) were developed during the Feasibility Study to aid in the development and screening of the remedial alternatives that were being considered. The RAOs for the site were:

- Prevent or minimize the potential for human exposure to contaminated soil and groundwater so that health-based allowable exposure limits are not exceeded; and
- Prevent or minimize the potential for future off-site migration of contaminants.

The selected remedy for soil was stabilization and solidification of all soil contaminated above risk-based levels into a solid monolith such that contaminants of concern would be unable to leach into the groundwater. All surface waste materials not amenable to the selected technology such as scrap metal, grinding balls, filters or drums were removed and disposed at an off-site hazardous waste landfill prior to treatment of the soil. Following treatment, the treated soil was covered with a soil cap to protect the treated material and prevent direct contact with human or ecological receptors. The protective cover was

required to be graded and planted with vegetation to reduce erosion. Covenants imposing restrictions on the future use of the site were implemented to ensure the integrity of the protective cover and the underlying solidified soil mass and to prevent exposures to the treated soil.

The selected remedy for groundwater was "no action." Groundwater monitoring was required for a minimum of five years.

An ESD was signed by the EPA on May 11, 1992. It modified the treatment technology as described in the ROD so that stabilization/solidification of contaminated soil could be conducted on-site and above ground instead of in situ. Contaminated soil from the McCarl and Baier subsites was consolidated at the Baier subsite, mixed with stabilizing/solidifying reagents. The resulting monolith was then covered with impermeable clay, clean topsoil and a vegetative cover.

4.2 Remedy Implementation

In a CD entered into with the United States on April 23, 1992, DuPont agreed to perform the RD and RA and pay the EPA's response costs associated with the site. The RD was conducted in conformance with the ROD as modified by the ESD. The RD was approved by the EPA on June 5, 1992.

The major components of the RA were:

- Removal of surface debris not amenable to solidification and subsequent disposal at an EPA-approved landfill;
- Excavation of contaminated subsurface material from both subsites exceeding 150 mg/kg of chromium, 350 mg/kg of lead, 10 mg/kg of selenium and 20 mg/kg of cadmium and placement in a stockpile for subsequent treatment and disposal at the Baier subsite;
- Stabilization/solidification of contaminated soil from both subsites;
- Construction of a soil cover to prevent human or ecological contact with the treated soil;
- Introduction of vegetation to prevent erosion of the soil cover;
- Implementation of land use controls to help ensure that no unacceptable exposures occur; and
- Groundwater monitoring to ensure that no unacceptable contaminant concentrations occur in groundwater in the future.

Further requirements for the RA were included in the Statement of Work, Appendix B of the CD, as follows:

- Soil contaminated above the cleanup levels was required to undergo stabilization/solidification to a depth of two feet below the waste/soil interface or to the known depth of metals contamination, whichever was deeper;
- Following treatment, the treated soil was required to be covered with a minimum of one foot of topsoil prior to grading and planting with suitable vegetation; and
- Erosion controls were required to be included in the RD and/or Inspection and Maintenance Plans, if necessary.

The performance criteria for the soil that was stabilized/solidified were as follows:

- Hydraulic conductivity less than or equal to 1×10^{-7} centimeters/second;
- Leachability test results demonstrating compliance with Toxicity Characteristic Leachability Procedure metals standards for lead and chromium of less than five milligrams per liter (mg/l)

and for cadmium and selenium of less than one mg/l;

- Unconfined compressive strength (UCS) of 250 pounds per square inch with a minimum UCS of 50 pounds per square inch after seven days;
- Freeze/thaw resistance in accordance with American Society for Testing and Materials (ASTM) Standard Test Method D4842; and
- Wet/dry testing in accordance with ASTM Standard Test Method D4843, with samples for both tests demonstrating a weight loss of eight to ten percent or less at the conclusion of each of the durability testing procedures.

Prior to the start of RA construction activities, surface debris from both subsites was accumulated, characterized and disposed of at a hazardous waste landfill. Construction activities at the McCarl subsite began in August 1992 and were completed in September 1992. At the Baier subsite, construction activities began in March 1992 and were completed in October 1993. Delays were encountered in the work schedule at the Baier subsite due to wet ground conditions as there was record-setting rainfall during the spring and summer of 1993. The subsites were surveyed, cleared of trees and dense vegetation and temporary surface water controls and access roads were constructed prior to the beginning of excavation activities.

A total of 2,408 cubic yards of contaminated soil was excavated from the McCarl subsite and transported to the Baier subsite, where it was stockpiled within the area of contamination awaiting treatment. The McCarl subsite was then backfilled with clean soil and covered with six inches of topsoil. The site was graded, fertilized and seeded. A pre-final site inspection was conducted by the EPA at the McCarl subsite on September 29, 1992.

Excavation at the Baier subsite began with the construction of a disposal trench. Once completed, contaminated soil from the trench location and the McCarl subsite was placed in the trench. A total volume of 6,795 cubic yards of contaminated soil was excavated from the Baier subsite and placed in the trench.

Stabilization of the excavated soil was achieved by mixing the contaminated soil with water and approximately 20 percent Type 1 Portland cement. The stabilization process was completed within the disposal trench.

After chemical and physical performance testing of the stabilized material, a three-foot thick layer of compacted clay followed by a one-foot thick layer of topsoil was placed over the treated material. After placement of the topsoil, the disposal trench area was graded, fertilized and seeded. A pre-final inspection was conducted by the EPA at the Baier subsite on September 10, 1993.

The site achieved construction completion status when the Preliminary Close-Out Report was signed on September 29, 1993. The EPA and the State determined that all RA construction activities, including the implementation of institutional controls, were performed according to specifications. The Final Close-Out Report for the site was signed on August 1, 1994, and the site was deleted from the NPL on September 25, 1995.

One year of quarterly groundwater sampling at the McCarl subsite began in September 1992 and then was conducted annually through September 1996. One year of quarterly groundwater sampling at the Baier subsite began in September 1993 and was then conducted annually through September 1996. Following the first five-year review in 1997, the groundwater monitoring was conducted biennially, in 1998 and 2000. Following the first five-year review sampling groundwater for VOCs was discontinued.

Based upon the recommendations made during the second five-year review, groundwater monitoring at the Baier subsite continued in 2003, 2004, 2006, 2008 and 2010 to continue to evaluate the stability of the treated soil left in place at the subsite. During the second five-year review, it was determined that it was no longer necessary to continue groundwater monitoring at the McCarl subsite since contaminated soil was removed from the subsite and the monitoring wells were properly abandoned in July 2003.

4.3 Systems Operation and Maintenance

DuPont continues to conduct long-term monitoring, inspection and maintenance activities at the site according to the Remedial Action Inspection and Maintenance Plan and the Groundwater Monitoring Plan, which were approved by the EPA. The primary activities associated with the operation and maintenance (O&M) of the remedy include:

- Groundwater monitoring of the shallow and deeper water-bearing zones at the Baier subsite which has been conducted biennially since the first five-year review;
- Inspection of the groundwater monitoring wells;
- Inspection of the ground cover including the cap and vegetation at the Baier subsite; and
- Inspection of the site fencing.

The estimate for O&M costs in the ROD was approximately $12,000 per year. The actual O&M costs for the past five years, shown in Table 2, were provided by DuPont. In the past five years the costs have been somewhat higher than the estimate in the ROD but consistent with past years. In 2011, an additional round of groundwater samples was collected and analyzed at the request of the EPA, resulting in higher than normal costs. The EPA does not currently anticipate that additional sampling will be requested in the future.

Table 2
Annual Operation and Maintenance Costs
Since the Third Five-Year Review

Year	Total Cost
2007	$19,430
2008	12,960
2009	14,972
2010	16,628
2011	26,795

5.0 Progress Since Last Review

The protectiveness statement in the Third Five-Year Review Report for the site was as follows: The remedy at the DuPont County Road X-23 site is protective of human health and the environment.

The recommendations made in the Third Five-Year Review Report included:

- The soil cover at the Baier subsite was to be sampled in 2008 and 2011 to evaluate the need to apply nutrients to promote growth of the vegetative cover with application as needed.
- Continued biennial groundwater monitoring for metals at the Baier subsite.
- Discontinue inspection and maintenance at the McCarl subsite.
- Continued inspection at the Baier subsite twice per year.

In January 2009, it was determined that it was no longer necessary to routinely sample the soil of the cover at the Baier subsite. The vegetative cover has been in excellent condition for numerous years and that serves as an indication that the soil conditions are favorable for healthy growth. DuPont has modified the Site Inspection Report to include additional observations and corrective actions should this cease to be the case in the future.

Groundwater monitoring for metals was conducted at the Baier subsite in September 2008 and September 2010. In addition to these biennial groundwater monitoring events, DuPont sampled the monitoring wells at the Baier subsite for VOCs in December 2011, at the request of the EPA. This request was made because it had been 15 years since the groundwater had been sampled for these contaminants. Although the stabilization/solidification process likely released VOC contamination from the soil through mixing and the exothermic reaction that takes places during such treatment, it was determined that sampling groundwater would verify that these assumptions were correct and VOCs were not being released from the treated soil. The results of these sampling events are thoroughly described later in this report.

DuPont conducted routine inspections of both subsites twice a year during the past five years. Although the EPA did not require on-going inspection and maintenance of the McCarl subsite, DuPont chose to continue these inspections.

6.0 Five-Year Review Process

6.1 Administrative Components

The five-year review process was initiated on June 22, 2011, with a meeting of the team of people who would be working on the review. The team working on this five-year review includes the EPA Remedial Project Manager, Diana Engeman, as well as additional EPA technical staff, a community involvement coordinator and legal staff. Representatives of DuPont and their consultant, URS, provided information necessary to conduct this five-year review.

6.2 Community Involvement

A fact sheet announcing the start of the fourth five-year review was emailed to federal and state congressional offices, mailed to local interested parties and placed on the EPA Region 7 website on December 14, 2011. On January 16, 2012, a public notice regarding the start of the fourth five-year review was published in the *Fort Madison Daily Democrat*. Local interested parties include city and county officials, local organizations and citizens who have expressed an interest in the site. In general, the community interest in the DuPont County Road X-23 site has been low. There were no comments or questions provided to the EPA from the public during this five-year review.

Soon after approval of this Fourth Five-Year Review Report, a notice will be placed in the same newspaper announcing that the Report is complete and that it is available to the public at the Fort Madison Public Library in Fort Madison, Iowa, and the EPA Region 7 office.

6.3 Document Review

This five-year review consisted of a review of relevant documents, including Site Inspection Reports and Groundwater Sampling Reports. A complete list of documents reviewed as part of the five-year review process is included in Attachment 1.

6.4 Data Review and Evaluation

Site Inspection and Maintenance

The plan for site inspection and maintenance is included in the Remedial Action Inspection and Maintenance Plan, which is Attachment 4 to the Remedial Design Report. According to this report, inspection and maintenance of the soil cover, vegetative cover, drainage channels and the site in general were scheduled for three times per year for the first three years following completion of the RA to ensure continued integrity of the RA (1994, 1995 and 1996) and twice per year for the next seven years (1997 through 2003). Additionally, shallow soil sampling of the soil cover was to occur on the third, sixth and ninth years following completion of the RA (1996, 1999 and 2002) to evaluate the need to apply lime or fertilizer to promote vegetation growth. There were no specific plans beyond the ninth year.

For this Five-Year Review Report, Site Inspection Reports were reviewed for site visits conducted in October 2007; April and October 2008; March and November 2009; March and October 2010; March and November 2011 and March 2012. These inspections were performed by the environmental staff from the DuPont plant in Fort Madison. On each occasion except March 2012, both the Baier and McCarl subsites were visually inspected regarding the condition of the soil caps and vegetative covers, development of areas of erosion, development of natural drainage channels, the condition of monitoring wells and site fences and gates. The EPA did not require inspection of the McCarl property during the past five years since all of the wastes and the monitoring wells have been removed from the property and there are no longer any use restrictions, but DuPont prefers to continue these inspections of this property.

Throughout the period of time since the previous five-year review, the vegetation has continued to be well established at the Baier subsite. In January 2009, it was determined that the collection of soil samples to determine if sufficient nutrients were in the soil to support vegetation growth were unnecessary due to the healthy condition of the grass. It was decided that any future decision to sample or apply soil amendments would be based on the condition of the vegetation during inspection rather than an arbitrary schedule. Maintenance issues related to fencing during the past five years occurred at the Baier subsite in 2007, 2008 and 2009. Minor repairs were completed shortly after they were discovered. No issues were identified related to the condition of the monitoring wells in the past five years.

Groundwater Monitoring

Since the third five-year review, groundwater monitoring of the shallow and deeper water-bearing zones of the Baier subsite was conducted in September 2008, September 2010 and December 2011.

Groundwater monitoring is conducted according to the Groundwater Monitoring Plan, which is Attachment 5 to the Remedial Design Report. Figure 2 shows monitoring well locations for the Baier subsite.

During each of the sampling events, water level measurements were taken in the monitoring wells to determine the direction of groundwater flow in both water-bearing zones. During the past five years groundwater in the shallow water-bearing zone flowed to the southwest and in the deep water-bearing zone, groundwater flowed to the south/southwest. These flow directions are consistent with historical data for both zones.

Although cleanup levels were not established for groundwater in the ROD since the exposure pathway for groundwater is incomplete, groundwater monitoring results have been compared against the EPA Maximum Contaminant Levels (MCLs) for drinking water. MCLs, promulgated pursuant to the federal Safe Drinking Water Act, are set forth at 40 CFR Part 141. MCLs set forth the permissible levels of contaminants in water that is delivered to any user of a public water system. Summaries of the groundwater monitoring results for the Baier subsite may be found in Attachments 2.

Selenium was the only contaminant of concern (COC) which exceeded the MCL during the past five years. The MCL for selenium is 50 μg/l. In the shallow water-bearing zone at the Baier subsite, selenium was found at levels exceeding the MCL at monitoring wells BRA-1S (148 μg/l in 2008 and 155 μg/l in 2010) and BRA-2S (54.8 μg/l in 2008). This is consistent with what has been detected in these two wells in the past. Based on the direction of groundwater flow in this zone at the Baier subsite, both of these monitoring wells are upgradient of the area of contamination so it is unlikely that the selenium would be coming from site wastes. None of the COCs have exceeded MCLs in the deep water-bearing zone at the Baier subsite during the past five years. During the remedial investigation no connection between the two water-bearing zones was found.

Groundwater samples for VOCs were not collected after September 1996. During the first five-year review it was determined that it was no longer necessary to sample groundwater for these compounds because they were not being detected in the samples. The contaminated soil which was treated and remains at the Baier subsite, contained elevated levels of VOCs prior to treatment. The process of solidification/stabilization with Portland cement is an exothermic reaction which likely resulted in the volatilization of the VOCs in the soil. However, because it is unknown whether all of the VOCs in the waste material were actually released during treatment, and the fact that VOCs are generally quite soluble in water, in 2011 the EPA requested that DuPont sample the wells at the Baier subsite to confirm that releases of VOCs was not occurring. DuPont sampled the wells in December 2011 and reported the results in March 2012. There were no VOCs detected in any of the monitoring wells at the Baier subsite. Based on this information there are no plans to sample for VOCs in groundwater in the future at this site. The results of all sampling for VOCs in groundwater at the Baier subsite may be found in Attachment 3.

Institutional Controls

On September 20, 2007, DuPont recorded an Environmental Covenant with Lee County Iowa Recorder of Deeds which imposed activity and use limitations on the Baier subsite. This Environmental Covenant, which accords with the Iowa Uniform Environmental Covenant Act, accurately describes the Baier subsite property and supersedes the prior Declaration of Covenants and Restrictions. This Environmental Covenant prohibits residential, recreational or food chain agricultural uses of the property and the installation of water wells. It includes a requirement that the property be fenced. The Environmental Covenant also includes a requirement that DuPont submit verification to the EPA

annually that the activity and use limitations remain in place and were complied with during the preceding year. This notice has been submitted each year since imposition of the Environmental Covenant, most recently in a letter dated January 25, 2012.

Through the filing of this Environmental Covenant, the restrictions on the property known as the McCarl subsite were released. It was determined in 2007 that these restrictions were no longer needed since wastes and monitoring wells no longer exist on this property.

6.5 Site Inspection

An inspection of both of the subsites was conducted on May 17, 2012. Participating in the inspection were Diana Engeman, EPA Remedial Project Manager and Brenda Swyter, Environmental Resource at the DuPont Fort Madison Plant. The purpose of the inspection was to assess the protectiveness of the remedy, including the conditions of the fencing, the integrity of the cap at the Baier subsite, the condition of the monitoring wells and compliance with the Environmental Covenant. The inspection began with a meeting at the Fort Madison plant and then both subsites were inspected. The subsites were found to be in excellent condition and there was nothing indicating noncompliance with the Environmental Covenant. The Site Inspection Checklist is Attachment 4 to this report.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

YES. The selected remedy in the ROD included disposal of debris; excavation and solidification/ stabilization of contaminated soil that exceeded action levels; construction of a vegetated soil cover; groundwater monitoring; and implementation of institutional controls. The excavation, stabilization/ solidification and capping of contaminated soil has achieved the remedial action objectives of preventing or minimizing the potential for exposure to contaminated soil and groundwater and to prevent or minimize the potential for future off-site migration of contaminants. The effective implementation of an Environmental Covenant also prevents or minimizes exposure to contaminated soil and groundwater as well as ingestion of contaminated groundwater.

Operation and maintenance of the cap has been effective. Maintenance has been performed as needed and appears to be effective. Over the past five years the costs have occasionally exceeded the estimate in the ROD of approximately $12,000, however, the costs do not appear to be excessive and it is anticipated that they will continue to be fairly consistent in the future.

The relative stability of the groundwater monitoring results at the Baier subsite, throughout the implementation of the remedy, indicates that the solidified/stabilized soil with its clay cap is stable. All of the contaminated soil from the McCarl subsite was excavated, treated and disposed of at the Baier subsite. Results of recent groundwater sampling for VOCs at the Baier subsite do not indicate that there have been any releases of VOCs from the treated soil to the groundwater.

The Environmental Covenant that is in place on the Baier subsite prohibits residential, recreational or food chain agricultural uses of the property and the installation of water wells. It includes a requirement that the property be fenced. There were no activities observed that violate these requirements. At the time of the EPA's inspection of the Baier subsite, the capped area as well as the area surrounding it was undisturbed with a thick cover of vegetation, and no new uses of groundwater were observed. The Baier

subsite remains fenced and secure. The Environmental Covenant includes a requirement that DuPont verify annually that the activity and use limitations continue in place and were complied with during the preceding year, which has been done.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of remedy still valid? YES.

Changes in Standards and To Be Considers (TBCs)

- *Have there been changes to risk-based cleanup levels or standards identified as applicable or relevant and appropriate requirements (ARARs) in the ROD that call into question the protectiveness of the remedy?* The ROD established cleanup levels only for soil as it was determined in the baseline risk assessment that no exposure to contaminated groundwater would occur due to the low groundwater yield from the contaminated zone. However, groundwater is monitored to ensure that the stabilized/solidified soil is not releasing contaminants into the groundwater.

  The chemical-specific soil cleanup levels established in the ROD were 350 mg/kg for lead; 150 mg/kg for chromium; 10 mg/kg for selenium; and 20 mg/kg for cadmium. Contaminated soil exceeding these levels at both subsites was excavated, treated and then capped at the Baier subsite. These soil cleanup levels were compared to the most recent EPA Regional Screening Levels (RSLs) for residential soil as the RSLs generally are derived using the latest toxicity values (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm). Currently, the RSLs are higher for all of the contaminants than the soil cleanup values for this site, assuming residential use of the site, with the exception of chromium. The RSLs are 400 mg/kg for lead; 390 mg/kg for selenium; and 70 mg/kg for cadmium. Chromium is present in two valence states: the less toxic trivalent chromium (Cr^{+3}) and the significantly more toxic hexavalent chromium (Cr^{+6}). The chromium associated with this site was predominantly present as lead chromate which is most likely comprised of Cr^{+6}. During preparation of the Baseline Risk Assessment for this site it was assumed that all of the chromium associated with the site was Cr^{+6}. Evaluations of the toxicity of Cr^{+6} continue but the most recent toxological values used in developing the RSLs for Cr^{+6} result in a residential soil screening level of 0.29 mg/kg at the 1×10^{-6} cancer risk level, which is significantly lower than the cleanup level of 150 mg/kg in the ROD.

  Contaminated soil was removed from the McCarl subsite and transported to the Baier subsite. Confirmation samples of the residual soil at the McCarl subsite were collected and they did not exceed the soil cleanup levels for lead, selenium or cadmium. The residual levels of total chromium at the McCarl subsite ranged from a high of 13.06 mg/kg to below detection limits. Confirmation samples were also collected from the areas that were excavated at the Baier subsite. The two highest levels of residual total chromium at the Baier subsite were 64 mg/kg and 41.74 mg/kg, with the remaining samples from 28 mg/kg to below detection limits. While these levels of residual total chromium would exceed the most conservative Cr^{+6} screening levels, only two individual sample locations are outside the 1×10^{-4} acceptable carcinogenic risk range. These two elevated levels occur at the Baier subsite where an Environmental Covenant has been placed on the property preventing residential and food chain agricultural use. Therefore, it can be concluded that these two locations with elevated residual chromium do not adversely affect the protectiveness of the remedy.

Since there is no exposure to the contaminated groundwater, and the underlying aquifer has not been affected by site contaminants, no action was taken at the site for the remediation of groundwater. There are no federal or state ARARs for the selected "no action" alternative because compliance with federal and state ARARs is not required as no remedial action is necessary to protect human health and the environment. Groundwater is periodically sampled at the Baier subsite as a means of monitoring the effectiveness of the soil treatment remedy. The groundwater samples are compared to MCLs for drinking water. Since 1991, when the ROD was signed, the EPA has adopted a number of MCLs for drinking water. The previous MCL for cadmium was 10 µg/l and the current MCL is 5 µg/l. The previous MCL for arsenic was 50 µg/l and the current MCL is 10 µg/l. These levels have not been exceeded in groundwater samples collected at the Baier subsite. Recent sampling for VOCs in groundwater indicates that VOCs are not present at this site. Accordingly, it is the EPA's determination that the remedy continues to be protective.

Exposure assumptions, toxicity data, ecological cleanup levels and RAOs were not selected specifically for ecological receptors at the site. The action level for cadmium exceeds the Ecological Soil Screening Levels (Eco-SSLs) for some avian and mammalians, however there is a one to three foot cap over these soils and confirmation samples of the topsoil showed 8.0 mg/kg of lead; 11.1 mg/kg of chromium and non-detectable levels of cadmium and selenium. This level of lead in the topsoil is below the lowest EPA Eco-SSL for avian lead in soil of 11.0 mg/kg. There is not an Eco-SSL for total chromium, therefore a total chromium screening level of 0.40 mg/kg was utilized. That value results in a chromium hazard quotient of 28 for the site which exceeds the target of not exceeding a hazard quotient of one. However, chromium levels ranging from 2 to 25,000 mg/kg are found in Iowa native soils. Therefore, the EPA Region 7 ecological risk assessors do not find there is an ecological risk to receptors due to metals in topsoil at the site.

- *Are there newly promulgated standards that call into question the protectiveness of the remedy?* No.

- *Have TBCs used in selecting cleanup levels at the site changed in ways that could affect the protectiveness of the remedy?* TBCs were not used in selecting cleanup levels for this site.

Changes in Exposure Pathways

- *Has land use or expected land use on or near the site changed (e.g., industrial to residential, commercial to residential)?* Land use has not changed at the site. DuPont owns the properties that comprise both the Baier and McCarl subsites and it is reasonably anticipated that future land use will remain the same. Further, the Baier subsite has an Environmental Covenant placed on the property that restricts uses that may result in unacceptable future exposures.

- *Have any human health or ecological routes of exposure or receptors changed or been newly identified (e.g., dermal contact where none previously existed, new populations or species identified on-site or near the site) that could affect the protectiveness of the remedy?* No.

- *Are there newly identified contaminants or contaminant sources?* The available data do not demonstrate the presence of new contaminants or contaminant sources.

- *Are there unanticipated toxic by-products of the remedy not previously addressed by the decision documents (e.g., byproducts not evaluated at the time of remedy selection)?* Sampling has not indicated the presence of any unanticipated toxic byproducts at the site.

- *Have physical site conditions (e.g., changes in anticipated direction or rate of groundwater flow) or the understanding of these conditions (e.g., changes in anticipated direction or rate of groundwater flow) changed in a way that could affect the protectiveness of the remedy?* NO.

Changes in Toxicity and Other Contaminant Characteristics

- *Have toxicity factors for contaminants of concern at the site changed in a way that could affect the protectiveness of the remedy?* Numerous toxicity values have changed since the completion of the Baseline Risk Assessment and Supplemental Risk Assessment in 1991. Comparisons of the past and current toxicity values are shown in Table 3. However, since completion of the soil remediation activities, no exposure to contaminated soil is occurring. The selected remedy for soil was stabilization and solidification of all soil contaminated above risk-based levels into a solid monolith. The treated soil was then covered with impermeable clay, clean topsoil and a vegetative cover. In addition, covenants imposing limitations on the future use of the site were implemented to ensure the integrity of the protective cover and the underlying solidified soil mass and to prevent contact with the treated soil.

Table 3
Comparison of Past and Current Toxicity Values

	Risk Assessment Toxicity Values		2007 Toxicity Values (Third Five-Year Review)		Current Toxicity Values	
Chemical	SF_o	RfD_o (mg/kg-day)	SF_o	RfD_o (mg/kg-day)	SF_o	RfD_o (mg/kg-day)
Arsenic	1.75	1.00e-03	1.5	3.00e-04	1.5	3.0e-04
Barium	---	5.00e-02	---	2.00e-01	---	2.0e-01
Cadmium	---	1.00e-03	---	5.00e-04	---	5.0e-04
Chromium	---	5.00e-03	---	3.00e-03	5.0e-01	3.0e-03
Copper	---	1.30e+00	---	4.00e-02	---	4.0e-02
Lead	NA	NA	NA	NA	NA	NA
Manganese	---	2.00e-01	---	1.40e-01	---	1.4e-01
Selenium	---	3.00e-03	---	5.00e-03	---	5.0e-03
Zinc	---	2.00e-01	---	3.00e-01	---	3.0e-01

SF_o – Oral Slope Factor
RfD_o – Oral Reference Dose
NA – Not Applicable

For groundwater, the Baseline Risk Assessment indicated that no unacceptable exposure to contaminated groundwater would occur due to the low groundwater yield from the contaminated zone. Additionally, the Environmental Covenant prohibits installation of water wells.

As discussed above, evaluations into the toxicity of Cr^{+6} continue but the most recent toxological values used in the RSLs for Cr^{+6} result in a residential soil screening level of 0.29 mg/kg at the

1×10^{-6} cancer risk level, which is significantly lower than the cleanup level of 150 mg/kg in the ROD. Two confirmation samples taken from the Baier subsite would exceed the 1×10^{-4} carcinogenic risk range. Unacceptable exposures resulting from contamination on that property are further protected against by an Environmental Covenant restricting the property use. In the future the EPA may finalize toxicity factors for Cr.

Ecological toxicity values have also changed over time but they do not have an effect on the protectiveness of this remedy.

- *Have other contaminant characteristics changed in a way that could affect protectiveness of the remedy?* There are no other known changes to contaminant characteristics that could affect the protectiveness of the remedy.

Changes in Risk Assessment Methods

Have standardized risk assessment methodologies changed in a way that could affect the protectiveness of the remedy? Some standardized risk assessment methodologies have changed since the Baseline Risk Assessment and Supplemental Risk Assessment were completed in 1991. Currently, dermal contact with contaminated water while showering and bathing would be quantified, and the EPA has more recent guidance on quantifying exposure for both the dermal and inhalation routes of exposure than those used in 1991. However, these changes do not affect the protectiveness of the remedy as indicated in the discussion on changes to toxicity values.

In 1998 the EPA Final Ecological Risk Assessment Guidance was published. However, it has been determined that the ecological risk assessment that was performed at the site was adequate and does not adversely affect the protectiveness of the remedy.

Evaluation of Remedial Action Objectives (RAOs)

The RAOs for the site were:

- Prevent or minimize the potential for human exposure to contaminated soil and groundwater so that health-based allowable exposure limits are not exceeded; and
- Prevent or minimize the potential for future off-site migration of contaminants.

The response actions taken address the threats posed by this site and continue to protect human health and the environment through the: (1) prevention of human exposure to contaminants in soil and groundwater through the excavation, solidification and placement of the solidified mass into a land disposal unit at the Baier subsite, which has a vegetated soil cap; (2) implementation of institutional controls through an Environmental Covenant that places activity and use limitations on the property designed to prevent unacceptable exposures to contamination and (3) minimization of off-site migration of contaminated groundwater by solidification of contaminated soil as well as the placement of a low permeability clay layer followed by top soil at the Baier subsite. Therefore, the RAOs have been, and continue to be, met.

7.3 Question C: Has other information come to light that could call into question the effectiveness of the remedy? NO.

No ecological targets were identified during the ecological risk assessment and none were identified during this five-year review and therefore monitoring of ecological targets is not necessary. There have not been any weather-related events that have affected the protectiveness of the remedy. There is no other new information that calls into question the protectiveness of the remedy at this site.

7.4 Summary of Technical Assessment

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD, as modified by the ESD. There have been no changes to the physical conditions of the site that would affect the protectiveness of the remedy. The cap and vegetative cover at the Baier subsite remain in good condition. The monitoring wells also remain in good condition. The results of the groundwater monitoring do not indicate that the treated soil is releasing site contaminants into the groundwater. While there have been changes in some of the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, due to the remediation activities no exposure to contaminated media is occurring and therefore, toxicity has no bearing. There has been no change to the standardized human health or ecological risk assessment methodology that could affect the protectiveness of the remedy. There have been no changes in land usage that adversely affects the protectiveness of the remedy. The Environmental Covenant that was placed on the Baier subsite in September 2007 is durable and enforceable. DuPont has annually verified that the activity and use limitations imposed by the Environmental Covenant continue in place and have been complied with during the preceding year. There is no other information that calls into question the protectiveness of the remedy.

For the past five years, semiannual inspections of both subsites were conducted by DuPont personnel. They inspect the condition of the cap and vegetative cover, ensure that the fence, gates and locks are in good condition and verify that all monitoring wells are in good condition. During the past five years only minor problems have been identified and promptly addressed.

Inspection and maintenance of the Baier subsite should continue to occur semiannually. The Environmental Covenant should remain in place with annual verification that it exists and has been complied with. Groundwater monitoring for metals at the Baier subsite will continue biennially.

8.0 Issues

There were no issues identified during this five-year review.

9.0 Recommendations and Follow-up Actions

There were no recommendations or follow-up actions identified during this five-year review.

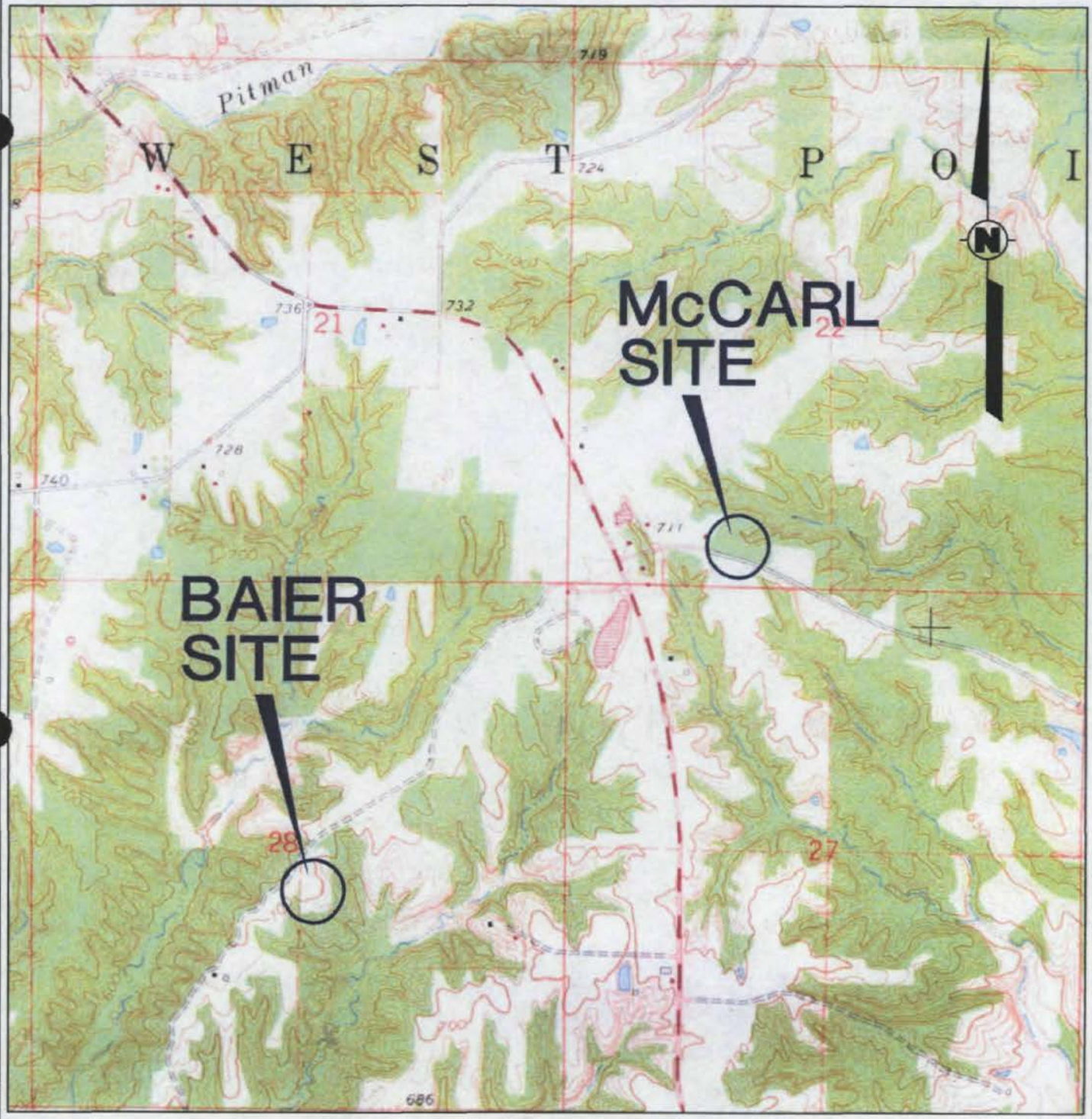
10.0 Protectiveness Statement

The remedy at the E.I. du Pont de Nemours & Co., Inc. County Road X-23 site is protective of human health and the environment.

11.0 Next Five-Year Review

The next five-year review for the E.I. du Pont de Nemours & Co., Inc. County Road X-23 site will be required in June 2017.

Figure 1



SCALE

2000 0 2000 FEET

SOURCE: USGS QUADRANGLE: WEST POINT (1964)

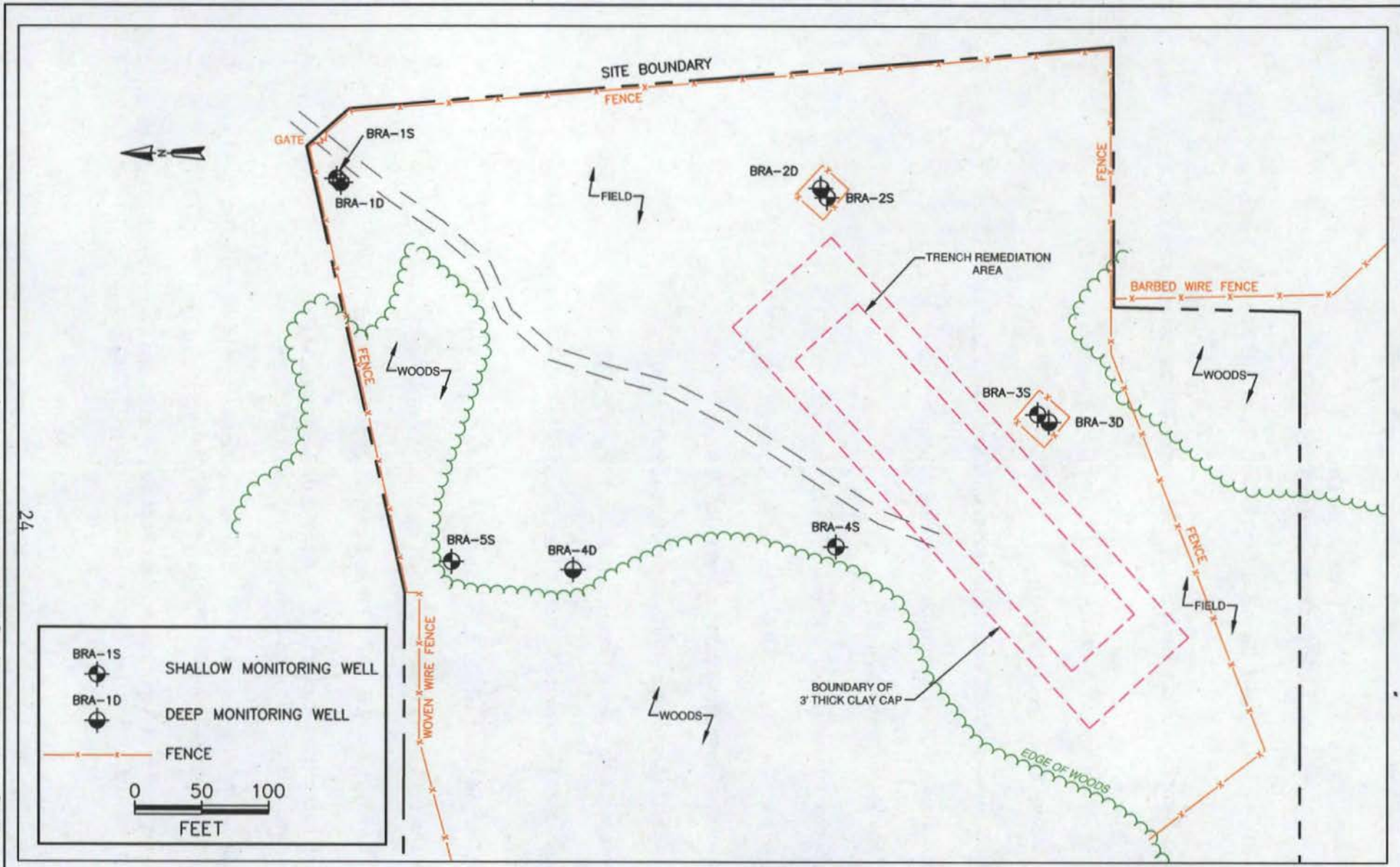
URS

URS Corporation
Iron Hill Corporate Center
4051 Ogletown Road, Suite 300
Newark, Delaware 19713
Phone: 302-781-5900
Fax: 302-781-5901

SITE LOCATION MAP

COUNTY ROAD X23
LEE COUNTY, IOWA

SCALE	DESIGNED	DRAWN	PROJECT NO
1"=2000'	S. POOLE	D. LITTEL	18685980
DATE	CHECKED	APPROVED	FIGURE
2/16/11	D. ENGLISH		1



NOTE:

REMEDIATION AREA LOCATION FROM DRAWING #92200-2 SHEET 2 OF 3, DATED 8/22/93 BY REGISTERED LAND SURVEYOR (STATE OF IOWA), MR. DAVID R. WOLFE, AS SHOWN ON WOODWARD-CLYDE DRAWING 4-2, PROJECT NUMBER 89C7583-2.

DESIGNED BY: M. BRILL	URS Corporation Iron Hill Corporate Center 4051 Ogletown Road, Suite 300 Newark, Delaware 19713 Phone: 302-781-5900 Fax: 302-781-5901	MONITORING WELL AND REMEDIATION AREA LOCATION MAP DUPONT BAIER SITE COUNTY ROAD X23 LEE COUNTY, IOWA
DRAWN BY: D. LITTEL		PROJECT NO. 18986224
DATA QUALITY CHKD: M. BRILL		DATE 2/15/12
APPROVED BY:		FIGURE No: 2

U:\Baier-McCarl Landfill\CAD\18985960\Figure 2 MW Location Map.dwg, 2/21/2012 2:23:48 PM, DWG To PDF.pc3

Figure 2

Attachment 1
Site Documents Reviewed

2008 Groundwater Sampling Report, Baier Landfill, County Road X23 Superfund Site, Lee County, Iowa, February 2007

2010 Groundwater Sampling Report, Baier Site, County Road X23 Superfund Site, Lee County, Iowa, March 2011

Consent Decree, United States of America v. E. I. DuPont De Nemours & Company, May 21, 1992

Email Re: Baier McCarl Cost, March 19, 2012

Email Re: Past VOC Groundwater Sampling Information, December 12, 2011

Email Re: Past and Future VOC Groundwater Sampling, December 13, 2011

Environmental Covenant, September 20, 2007

Environmental Covenant Compliance Notification letter, January 22, 2008

Environmental Covenant Compliance Notification letter, January 8, 2009

Environmental Covenant Compliance Notification letter, January 7, 2010

Environmental Covenant Compliance Notification letter, January 5, 2011

Environmental Covenant Compliance Notification letter, January 25, 2012

Explanation of Significant Differences for the DuPont County Road X23 Superfund Site, Lee County, Iowa, May 11, 1992

Five-Year Review DuPont County Road X23 Site, Lee County, Iowa, June 19, 1997

Five-Year Review DuPont County Road X23 Site, Lee County, Iowa, August 16, 2002

Five-Year Review DuPont County Road X23 Site, Lee County, Iowa, August 15, 2007

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 16, 2007

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, April 3, 2008

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 31, 2008

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, March 30, 2009

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, November 3, 2009

Remedial Design Report, Final Design Submittal Baier Site and McCarl Site, Lee County, Iowa, May 1992

Revised Sampling and Analysis Plan, County Road X23 Superfund Site, Lee County, Iowa, February 2003

Site Inspection Report, Baier Site, March 26, 2010

Site Inspection Report, McCarl Site, March 26, 2010

Site Inspection Report, Baier Site, October 22, 2010

Site Inspection Report, McCarl Site, October 22, 2010

Site Inspection Report, Baier Site, March 31, 2011

Site Inspection Report, McCarl Site, March 31, 2011

Site Inspection Report, Baier Site, October 31, 2011

Site Inspection Report, McCarl Site, October 31, 2011

Submittal of December 2011 VOC Groundwater Sampling Results, County X23 (*sic*) Superfund Site, March 15, 2012

Superfund Record of Decision: E. I. du Pont de Nemours (County Rd X23), Iowa, May 1991

Table 4
Groundwater Concentrations: 1993 to 2010
Shallow Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-1S														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	<0.0268	[illegible]	[illegible]	[illegible]	[illegible]	0.0247 J	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	<0.0019	<0.0047	0.0056 B	<0.0029	<0.0029	<0.0035	[illegible]	0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	0.0034 J	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.109 B	0.0766 B	0.107 B	0.0611 B	0.0488 J	0.0476 J	0.0562 J	0.0526 J	0.0442 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00027 B	<0.00021	<0.00036	<0.00012	0.000062	0.0002 B	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	<0.00047	<0.00028	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	152	156	150	160	158	157	162	165	154	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.00096 B	0.0054 B	<0.0013	<0.0018	<0.0014	<0.00091	<0.0012	0.0014 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	<0.00076	0.0023 B	0.00088 B	<0.0013	<0.0011	<0.001	<0.00072	<0.00049	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	0.0038 B	<0.00079	0.0027 J	0.0013 J	0.0027 J	<0.00073	0.005 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	<0.0149	0.13 J	0.234	0.201	0.205	0.0514 J	0.3[1]
LEAD	<CRDL	0.0051	0.004	<CRDL	<CRDL	<0.00043	0.00086 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	<0.0028	<0.0021	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	55.7	55.8	56.3	59	57.4	56.9	57	58.3	55.4	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	0.0235	[illegible]	<0.00022	0.0109 J	0.0149 J	0.0345 J	0.0175J	0.0038 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	000097 B	<0.000009	9.3E-05	<0.000026	<0.000071	<0.000048	<0.00013	<0.000039	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0016 B	0.0058 B	0.0029 B	<0.0016	0.0019 J	0.0018 J	<0.0022	0.0016 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.98 B	1.61 B	2.13 B	1.64 B	2.34 J	2.15 J	1.97 J	1.93 J	1.81 J	—
SELENIUM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	<0.00057	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	382	408	40.2	42	39.5	40.7	39.9	42	40.4	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	<0.0011	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.006 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.0013 B	0.0074 B	0.0018 B	<0.0013	0.0015 J	0.0016 J	0.0006 J	<0.00044	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.007 B	0.0127 B	0.0177 B	0.0022 B	0.0085 J	0.0034 J	0.0047 J	<0.005	0.009 B	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard

Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level

Screening Criteria: Federal Maximum Contaminant Levels (MCLs) as of 05/2009 unless specified

Attachment 2

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Table 4
Groundwater Concentrations: 1993 to 2010
Shallow Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-2S														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.764	0.27	1.3	0.307	0.0767 J	<0.0061	0.0136	0.0342 J	0.0384 J	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0016	<0.0019	<0.0047	<0.0023	0.0039 J	<0.0029	<0.0035	<0.0018	0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0023 B	0.0019 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	0.0032 J	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.111 B	0.078 B	0.0668 B	0.0927 B	0.0771 J	0.0537 J	0.167 J	0.0455 J	0.049 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00017 B	<0.00021	<0.00036	0.00037 J	0.00012 J	<0.000098	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	0.00049 B	<0.00049	0.00039 B	<0.00041	<0.00043	<0.00088	<0.00047	0.00034 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	155	197	166	147	138	149	213	176	112	—
CHROMIUM	0.021	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.00096 B	0.0018 B	0.0047 B	<0.0018	<0.0014	0.0037 J	<0.0012	0.0034 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0013 B	0.0016 B	<0.00078	<0.0013	0.0011 J	0.0032 J	<0.00072	<0.00049	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0022 B	0.0016 J	<0.00074	0.0043 J	<0.00073	0.0059 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	12.6	0.493	0.522	0.708	0.117 J	0.0721 J	0.215	0.0365 J	0.0447 J	0.3[1]
LEAD	0.003	0.0054	<CRDL	<CRDL	<CRDL	<0.00043	0.00096 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	<0.0028	0.0031 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	56.7	80.3	72.6	59.2	58.6	64	85.3	69.7	36.8	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0572	0.67	0.823	0.189	0.146	0.23	0.231 J	0.0893 J	0.0918	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	000053 B	0.000009	6.4E-05	0.000026	0.000071	000057 J	<0.00013	.000051B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0077 B	0.0066 B	0.0045 B	0.0018 J	0.0047 J	0.0076 J	<0.0022	0.0029 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.06 B	4.54 B	3.76 B	12.4	18.6 J	8.85	3.34 J	3.36 J	6.76	—
SELENIUM	<0.0611	0.024	0.0244	<CRDL	0.0275	0.0158	0.0047	0.0273	<0.0379	0.047 J	0.0341 J	<0.0240	0.0548	0.0492	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00082	<0.00057	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	38.8	60.1	54.2	50.4	47.7	43.6	38.3	38.9	39.9	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0028 B	<0.0011	0.0092 B	<0.0036	<0.0036	<0.0036	<0.0076	<0.0069	0.0054 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0056 B	0.0017 B	0.0026 B	0.0023 B	<0.0013	0.0013 J	0.0047 J	<0.00052	<0.00044	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0098 B	0.0092 B	0.0092 B	0.0013 B	<0.0046	<0.0016	0.0054 J	<0.005	0.0038 B	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Table 4
Groundwater Concentrations: 1993 to 2010
Shallow Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-3S														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0118	<0.0019	<0.0047	<0.0023	[illegible]	<0.0029	<0.0035	[illegible]	0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0023 B	0.0049 B	<0.0074	<0.0029	0.0057 J	0.0054 J	<0.0037	<0.0045	0.0074 J	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0982 B	0.08 B	0.0985 B	0.113 B	0.113 J	0.137 J	0.0876 J	0.0565 J	0.0615 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.0003 B	0.00032 B	<0.00036	0.00072 J	0.00032 J	0.00024 B	<0.00039	0.004
CADMIUM	<CRDL	0.0084	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00035 B	<0.00041	<0.00043	<0.00088	<0.00047	0.00076 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	249	245	186	211	201	217	239	194	179	—
CHROMIUM	0.0142	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.0018 B	0.0038 B	0.0039 B	0.0037 J	0.0081 J	0.0037 J	<0.0012	0.0021 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0044 B	0.0036 B	0.0078 B	0.0131 B	0.0211 J	0.0295 J	0.0166 J	0.0116 J	0.0175 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	0.0014 B	0.0045 B	0.0088 B	0.0073 J	0.0102 J	0.0068 J	<0.00073	0.0101 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.122	[illegible]	0.3[1]
LEAD	<CRDL	0.0046	<CRDL	<CRDL	<CRDL	<0.00043	0.002 B	<0.0023	0.0038	<0.0042	0.0061 J	<0.004	<0.0028	0.0037 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	102	98.5	78.1	86.2	80.1	88.8	96.8	75.7	71.2	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	000096 B	000017 B	0.00012	3.4E-05	0.000071	0.000048	<0.00013	000043 B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0096 B	0.0088 B	0.0198 B	0.0214 B	0.0257 J	0.026 J	0.017 J	0.0081 J	0.0123 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.08 B	2.89 B	3.2 B	3.16 B	2.53 J	3.94 J	2.53 J	3.82 J	5.4	—
SELENIUM	<CRDL	0.0279	0.0453	<CRDL	0.0264	0.03	0.0139	0.0215	0.02	0.0235 J	0.0168 J	0.0082 J	<0.0075	0.0231 J	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	0.00066 J	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.5	47.8	63.8	54.7	57.3	54.6	49.3	58.6	58.4	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0064 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0074 B	0.004 B	0.0076 B	0.0074 B	0.0076 J	0.0121 J	0.0081 J	0.0021 J	0.003 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0236	0.015 B	0.0205	0.02 B	0.0158 J	0.0239 J	0.0141 J	<0.005	0.0092 B	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard

Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level

Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Table 4
Groundwater Concentrations: 1993 to 2010
Shallow Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-4S														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	08/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0441 B	0.049 B	0.129 B							0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0057 J	<0.0029	<0.0035		0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0016	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	0.0053 J	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.102 B	0.101 B	0.145 B	0.0985 B	0.0929 J	0.124 J	0.167 J	0.114 J	0.144 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00036	0.00019 J	0.00026 J	0.00027 B	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00032 B	<0.00041	<0.00043	<0.00088	<0.00047	0.00067 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	151	138	107	88.8	53.3	66.4	76.5	61.4	59	—
CHROMIUM	0.0136	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	<0.00068	0.0037 B	0.002 J	0.0047 J	0.0125	0.0028 J	0.0075 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0045 B	0.0043 B	0.0014 B	<0.00078	0.0018 J	0.0045 J	0.0059 J	0.00096 J	0.0013 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0031 B	0.0076 J	0.0038 J	0.0120 J	0.0037 J	0.0085 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.147	0.116	0.176	0.196						0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00043	0.0011 B	<0.0023	<0.0024	<0.0042	<0.006	0.0104	0.0043 J	0.0082 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	63.3	55.9	40.7	32.8	12.7	15.3	26.3	12.6	11.6	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL										0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	000089 B	<0.000009	0.00003	<0.000026	0.000071	000085 J	<0.00013	000051 B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0076 B	0.0093 B	0.007 B	0.0042 B	0.0101 J	0.0099 J	0.017 J	0.0065 J	0.01 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.56 B	2.24 B	1.8 B	1.74 B	2.9 J	3.01 J	2.42 J	2.09 J	2.08 J	—
SELENIUM	0.0063	<CRDL	<CRDL	<CRDL	<CRDL	0.0016 B	<0.0007	<0.004	<0.0038	0.0021 J	<0.0034	<0.0062	<0.0075	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00040 J	<0.00062	<0.00057	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	35.1	35.9	37.1	27	16.2	15.3	19.8	11.1	9.69	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011							0.0062 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.0011 B	0.0014 B	0.0018 B	0.0035 J	0.0051 J	0.017 J	0.0042 J	0.0099 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0054 B	0.0116 B	0.0093 B	0.003 B	0.0151 J	0.0181 J	0.0576 J	0.0192 J	0.0391 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Table 4
Groundwater Concentrations: 1993 to 2010
Shallow Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-5S																Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	09/08	9/8/2008-DUP	09/10	9/14/2010-DUP	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.284	0.0495 B	1.28	<0.0268	0.513 J	<0.0061	<0.0152	0.0221 J	0.0187 J	[illegible]	[illegible]	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0038 J	<0.0029	<0.0035	<0.0019	<0.0061	<0.0038 UJ	<0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	<0.0045	0.0034 J	<0.0032	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0649 B	0.0292 B	0.175 B	0.04 B	0.095 J	0.0338 J	0.0319 J	0.0335 J	0.0328 J	0.0468 J	0.0491 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00038	0.00019 J	0.00018 J	<0.0002 B	0.00015 B	<0.00039	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00049 B	<0.00041	<0.00043	<0.00068	<0.00047	<0.00047	0.00034 B	0.00049 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	309	280	265	282	268	263	269	244	239	186	184	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	0.0043 B	<0.0013	<0.0018	<0.0014	<0.00091	<0.0012	<0.0012	<0.0011	0.0014 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0011 B	0.003 B	0.0026 B	0.0069 J	0.0011 J	0.0049 J	0.0038 J	0.0031 J	0.0045 J	0.0045 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	0.0035 B	0.0012 B	0.0056 J	<0.00074	0.0016 J	<0.00073	<0.00073	0.0064 J	0.0055 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.778	0.125	2.26	0.0833 B	2.01 J	<0.0111	0.0591 J	10.16	[illegible]	[illegible]	[illegible]	0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00043	0.001 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	<0.0028	<0.0028	<0.0021	0.0037 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	110	94.9	99.6	101	98.7	97.4	99.9	102	101	83.5	82.7	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	10.365	0.33	0.313	2.18	1.84	0.031	1.22 J	1.29 J	[illegible]	[illegible]	[illegible]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	000093 B	0.000009	000053 B	000049 B	0.000071	000074 J	<0.00013	00006 B	000061 B	<0.00003	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0068 B	0.0114 B	0.0401	0.0228 J	0.0097 J	0.022 J	0.0104 J	0.0089 J	0.0125 J	0.0134 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.52 B	3.45 B	3.23 B	3.4 B	3.39 J	3.36 J	3.04 J	3.49 J	3.36 J	2.81 J	2.8 J	—
SELENIUM	0.0063	<CRDL	0.0274	<CRDL	0.0172	<0.00068	0.017	<0.004	<0.0038	<0.002	<0.0034	<0.0062	<0.0075	<0.0075	<0.0024	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	<0.00057	<0.00057	<0.00075	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.1	45.4	51.4	49.8	58	53.2	48.5	44.7	43.7	38.1	37.9	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	<0.0065	<0.0133	<0.0068	<0.0066	<0.0079	<0.0 J	<0.0066	0.0065 B	0.0057 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0084 B	<0.0005	0.0055 B	0.0012 B	0.003 J	0.00079 J	<0.00085	0.00093 J	0.00059 J	<0.00044	<0.00044	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0046 B	0.0148 B	0.0145 B	0.0056 B	0.0073 J	<0.0016	0.003 J	<0.005	<0.005	0.0067 B	0.0085 B	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard

Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level

Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Table 5
Groundwater Concentrations: 1993 to 2010
Deep Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-1D														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/96	09/98	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	[redacted]	[redacted]	[redacted]	[redacted]	<0.0152	[redacted]	[redacted]	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[redacted]	<0.0019	<0.0047	<0.0023	0.0038 J	<0.0029	<0.0035	[redacted]	<0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	0.0016 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	0.0077 J	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.12 B	0.121 B	0.122 B	0.121 B	0.121 J	0.119 J	0.0984 J	0.107 J	0.117 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00016 B	<0.00021	<0.00036	<0.00012	<0.000062	0.00017 B	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	0.00055 B	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	<0.00047	0.00059 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	98.5	96.6	93.5	98.9	102	99	80.2	94.5	103	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	<0.00068	<0.0013	<0.0018	<0.0014	<0.00091	<0.0012	0.0022 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0038	0.001 B	0.0017 B	0.0014 B	0.0019 J	0.0027 J	<0.001	0.0012 J	0.0027 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	<0.00079	<0.00092	<0.00074	0.00091 J	<0.00073	0.0127 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.247	[redacted]	[redacted]	[redacted]	0.293 J	[redacted]	0.0122 J	0.107	[redacted]	0.3[1]
LEAD	<CRDL	0.0035	<CRDL	<CRDL	<CRDL	<0.00043	0.00085 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	<0.0026	0.0035 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	30.1	29.4	29.8	30.5	30.9	29.5	29	29.4	30	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0408 J	[redacted]	[redacted]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.00008 B	<0.000009	0.000032 B	<0.000026	<0.000071	<0.000048	<0.00013	0.00006 B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0131 B	0.0029 B	0.0034 B	0.0031 B	0.0042 J	0.0047 J	<0.0017	<0.0022	0.0057 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.93 B	2.96 B	2.93 B	2.97 B	3.26 J	3.24 J	2.84 J	3.32 J	3.2 J	—
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00068	<0.0007	0.0047 B	<0.0038	<0.002	<0.0034	<0.0052	<0.0075	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0026	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00052	0.00066 J	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.2	48.9	48.7	46.5	47.4	46.8	48.1	48	47.1	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0084 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	<0.0005	0.0012 B	0.0012 B	<0.0013	0.0015 J	<0.00085	<0.00052	0.0018 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.004 B	0.0222	0.0097 B	<0.0011	<0.0046	<0.0016	0.0025 J	<0.005	0.0112 B	5[1]

All units are mg/L.
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Table 5
Groundwater Concentrations: 1993 to 2010
Deep Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-2D														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	<0.043	<0.0266	<0.0418	<0.0061	<0.0152	<0.0047	<0.0128	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	<0.0029	<0.0029	<0.0035	[illegible]	<0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	<0.0032	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.121 B	0.119 B	0.106 B	0.123 B	0.12 J	0.124 J	0.115 J	0.111 J	0.115 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00036	<0.00012	<0.000062	0.00012 B	<0.00039	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	<0.00047	<0.00028	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	84.9	72.7	58.4	85.5	88.5	87.1	86.4	89.6	86.5	---
CHROMIUM	0.017	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	0.0011 B	<0.0013	<0.0018	<0.0014	<0.00091	<0.0012	<0.0011	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	<0.00076	<0.00088	0.00079 B	<0.0013	0.0016 J	0.0012 J	0.00072 J	<0.00049	---
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	<0.00079	<0.00092	<0.00074	0.00085 J	<0.00073	0.0019 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.3[1]
LEAD	0.0074	<CRDL	<CRDL	<CRDL	<CRDL	0.00043 B	0.001 B	0.0036	<0.0024	<0.0042	<0.006	<0.004	<0.0028	0.0025 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	33.6	30.2	22.2	33.9	34.3	33.6	33.9	33.8	32.8	---
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000089 B	0.000009 B	0.000084 B	<0.000026	<0.000071	<0.000048	<0.00013	0.000062 B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0016 B	<0.0019	0.0019 B	<0.0018	0.0028 J	0.002 J	<0.0022	0.0025 B	---
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.39 B	5.55	9.55	3.19 B	3.26 J	3.44 J	3 J	3.33 J	2.85 J	---
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00068	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0062	<0.0075	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00051 J	<0.00062	<0.00057	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	52.7	48.3	48.7	49.9	51.3	52.9	48.9	52.2	51.3	---
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0018 B	<0.0011	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0072 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.00058 B	0.0012 B	0.0011 B	<0.0013	0.00051 J	<0.00085	<0.00052	<0.00044	---
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.002	0.0037 B	0.0076 B	<0.0011	<0.0048	<0.0018	<0.0019	<0.005	0.0018 B	5[1]

All units are mg/L
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Table 5
Groundwater Concentrations: 1993 to 2010
Deep Wells
Baier Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-3D														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	<0.043	<0.0266	<0.0418	<0.0061	<0.0152	0.0109 J	<0.0128	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0118	<0.0019	0.0033 B	<0.0023	<0.0029	<0.0029	<0.0035	<0.0063	<0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	0.0015 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	<0.0032	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.163 B	0.153 B	0.143 B	0.134 B	0.144 J	0.144 J	0.129 J	0.129 J	0.155 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00038	0.00015 J	<0.000062	0.00019 B	<0.00038	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00068	<0.00047	0.0005 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	69.8	67.4	64.3	70.9	68.8	67.3	68.2	69.6	66.6	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00056	<0.00068	0.004 B	<0.0018	<0.0014	<0.00091	<0.0012	<0.0011	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0026 B	0.0024 B	0.0012 B	0.0023 J	0.0027 J	0.0035 J	0.0018 J	0.0121 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0016 B	<0.00092	<0.00074	0.00074 J	<0.00073	0.0021 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.202	0.198	0.0899 B	0.0809 B	0.186 J	0.0643 J	0.131	0.16	[redacted]	0.3[1]
LEAD	<CRDL	0.0059	<CRDL	0.0044	<CRDL	<0.00043	0.00086 B	0.0025 B	<0.0024	<0.0042	<0.006	<0.004	<0.0028	0.003 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	29.4	27.9	27.5	30.1	28.7	28.3	29.4	28.5	27.6	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000083 B	<0.000009	0.00015 B	0.000044 B	<0.000071	<0.000048	<0.00013	0.000054 B	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0048	0.0056 B	0.0059 B	0.0103 BP	0.0033 J	0.0054 J	0.0046 J	0.0034 J	0.0057 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.95 B	2.75 B	4.51 B	3.95 B	3.2 J	4.59 J	2.75 J	3.66 J	3.23 J	—
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00066	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0062	<0.0075	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0026	<0.00072	<0.00091	<0.00067	<0.00072	0.00054 J	<0.00062	<0.00057	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	54.2	51.4	50.9	52.9	50.7	52.3	48.2	52.2	51	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	0.0064 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.001 B	0.0011 B	0.001 B	<0.0013	0.00056 J	<0.00065	<0.00052	<0.00044	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.002	0.0126 B	0.0095 B	0.0028 B	<0.0046	<0.0016	0.0031 J	<0.005	0.0014 B	5[1]

All units are mg/L.
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Table 5
Groundwater Concentrations: 1993 to 2010
Deep Wells
Baler Site
County Road X23 Superfund Site
Lee County, Iowa

Well	BRA-4D														Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	09/08	09/10	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	5.66	0.344	<0.043	<0.0268	<0.0418	0.0412 J	0.059	[redacted]	[redacted]	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	<0.0029	<0.0029	<0.0035	[redacted]	<0.0038 UJ	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0033 B	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	<0.0045	<0.0032	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.148 B	0.0557 B	0.0504 B	0.0499 B	0.0474 J	0.0488 J	0.0726 J	0.0534 J	0.0605 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00038	0.00016 J	0.0001 J	0.00023 B	<0.00039	0.004
CADMIUM	0.0084	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00031 B	<0.00041	<0.00043	<0.00066	<0.00047	0.0004 B	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	211	206	175	189	191	173	187	180	174	—
CHROMIUM	0.0182	<CRDL	<CRDL	<CRDL	<CRDL	0.009 B	0.0006 B	0.0011 B	0.0034 B	<0.0018	<0.0014	0.0016 J	<0.0012	0.002 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0144 B	0.0051 B	0.0031 B	0.0034 B	0.0033 J	0.0034 J	0.0066 J	0.0055 J	0.0042 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0191 B	0.0017 B	<0.0014	<0.00079	<0.00092	<0.00074	0.0018 J	<0.00073	0.0045 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	18.2	1.03	0.598	0.104	0.0288 J	0.431	0.156	[redacted]	[redacted]	0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0062	0.00092 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	<0.0028	0.0048 B	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	83	82.1	73.5	77.5	76.3	71.4	78.2	74.5	69.2	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.33	0.983	0.899	1.23	1.56	0.719	0.174 J	[redacted]	[redacted]	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.00011 B	<0.000009	0.00012 B	0.000032 B	<0.000071	0.000072 J	<0.00013	<0.000039	<0.00003	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0224 B	0.0055 B	0.0061 B	0.0072 B	0.0067 J	0.0062 J	0.007 J	0.0059 J	0.0077 B	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	5.24	3.98	3.66 B	4 B	4.29 J	4.30 J	3.93 J	4.4 J	3.97 J	—
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00063	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0062	<0.0075	<0.0024	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00051 J	<0.00062	0.0011 J	<0.00075	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	71.6	61.8	75.5	68.5	71.3	68.2	60	68.6	71.7	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0043 B	<0.0011	<0.0005	<0.0025	<0.0054	<0.0068	<0.0079	<0.0059	0.0055 B	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0204 B	0.0012 B	0.0016 B	0.001 B	<0.0013	0.0013 J	0.0016 J	0.00096 J	<0.00044	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0549	0.0098 B	0.0079 B	<0.0011	<0.0046	<0.0016	<0.0019	<0.005	0.0028 B	5[1]

All units are mg/L
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit
J: Estimated Concentration
(1): Secondary Drinking Water Standard
(2): Action Level

ATTACHMENT 3
VOC Sampling Results

Table 1
Groundwater Sampling Data Results Summary for VOCs - December 2011
Baier Landfill Site
DuPont County Road X-23, Lee County, Iowa

CAS No.	Analyte	Units	MCL	Location:	BRA-01S	BRA-01D	BRA-02S	BRA-02D	BRA-03S	BRA-03D	BRA-04S	BRA-04D	BRA-05S	BRA-05S (DUP)
				Date Sampled:	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11	12/20/11
71556	1,1,1-TRICHLOROETHANE	UG/L	200		ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)
75354	1,1-DICHLOROETHENE	UG/L	7		ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)
78933	2-BUTANONE (METHYL ETHYL KETONE)	UG/L	--		ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)
67641	ACETONE	UG/L	--		ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)	ND (6)
71432	BENZENE	UG/L	5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
75150	CARBON DISULFIDE	UG/L	--		ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
108907	CHLOROBENZENE	UG/L	100		ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)
100414	ETHYLBENZENE	UG/L	700		ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)
108101	4-METHYL-2 PENTANONE (METHYL ISOBUTYL KETONE)	UG/L	--		ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)
75092	METHYLENE CHLORIDE	UG/L	5		ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
108883	TOLUENE	UG/L	1000		ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)	ND (0.7)
79016	TRICHLOROETHENE	UG/L	5		ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)

ND = Analyte not detected above stated (Method Detection Limit).

= Indicates a result that exceeds the MCL.

Attachment 4
Site Inspection Checklist

I. SITE INFORMATION

Site name: E. I. du Pont de Nemours & Co., Inc. County Road X-23	**Date of inspection:** 5/17/2012
Location and Region: Lee County, Iowa	**EPA ID:** IAD980685804
Agency, office, or company leading the five-year review: EPA-Region VII	**Weather/temperature:** mid-70s°F, sunny

Remedy Includes: (Check all that apply)

- ■ Landfill cover/containment
- ■ Access controls
- ■ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other

- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Farrah Thervil (Name) Remediation Project Director (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ■ by phone Phone no. 302-999-3203
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** Brenda Swyter (Name) Environmental Resource (Title) 5/17/2012 (Date)
   Interviewed ■ at site ☐ at office ☐ by phone Phone no. 319-376-5238
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A

Remarks On-site documents were not reviewed during site inspection.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks On-site documents were not reviewed during site inspection.

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ■ N/A
   Remarks

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	■N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	■N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	■N/A
☐ Other permits_____	☐ Readily available	☐ Up to date	■N/A

Remarks

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ■ N/A
   Remarks _____

6.	**Settlement Monument Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
7.	**Groundwater Monitoring Records** Remarks On-site documents were not reviewed during site inspection.	☐ Readily available	☐ Up to date	☐ N/A
8.	**Leachate Extraction Records** Remarks	☐ Readily available	☐ Up to date	■ N/A
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	■ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	■ N/A
	Remarks			
10.	**Daily Access/Security Logs** Remarks	☐ Readily available	☐ Up to date	■ N/A

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ■ PRP in-house
   - ☐ Federal Facility in-house
   - ☐ Other
   - ☐ Contractor for State
   - ■ Contractor for PRP
   - ☐ Contractor for Federal Facility

2. **O&M Cost Records** O&M Costs are discussed in the report.
   - ■ Readily available ☐ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate ☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: Described in report.

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ■ N/A
   Remarks Fence in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ■ N/A
   Remarks

C. Institutional Controls (ICs)

2. **Adequacy** ■ ICs are adequate ☐ ICs are inadequate ☐ N/A

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ■No vandalism evident

2. **Land use changes on site** ■ N/A
   Remarks No change in land use in or around site.

3. **Land use changes off site** ■ N/A
   Remarks No change in land use in or around site.

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ■ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ■ N/A

VII. LANDFILL COVERS ☐ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ■ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ■ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ■ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ■ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ■ Grass ■ Cover properly established ■ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ■ N/A
   Remarks_____

7. **Bulges** ☐ Location shown on site map ■ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ■ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ■ No evidence of slope instability
   Areal extent_____
   Remarks_____

B. Benches ☐ Applicable ■ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

C. Letdown Channels ☐ Applicable ■ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

D. Cover Penetrations ☐ Applicable ■ N/A

E. Gas Collection and Treatment ☐ Applicable ■ N/A

F. Cover Drainage Layer ☐ Applicable ■ N/A

G. Detention/Sedimentation Ponds	☐ Applicable ■ N/A
H. Retaining Walls	☐ Applicable ■ N/A
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable ■ N/A
VIII. VERTICAL BARRIER WALLS	☐ Applicable ■ N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES	☐ Applicable ■ N/A
X. OTHER REMEDIES	
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A. Implementation of the Remedy	
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). There is no exposure to site contaminants at the Baier subsite because access is limited by its location and the fence around the property; institutional controls are functioning as intended; and the cap and vegetative cover have been designed and maintained to prevent exposure.	
B. Adequacy of O&M	
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Maintenance of all elements of the remedy continue to prevent exposure to site contaminants.	
C. Early Indicators of Potential Remedy Problems	
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None	
D. Opportunities for Optimization	
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None recommended.	